



**ATTENUATED HUMAN-BOVINE CHIMERIC PARAINFLUENZA VIRUS (PIV)  
VACCINES**

**ABSTRACT OF THE DISCLOSURE**

- 5                   Chimeric human-bovine parainfluenza viruses (PIVs) are infectious and  
attenuated in humans and other mammals and useful individually or in combination in  
vaccine formulations for eliciting an anti-PIV immune response. Also provided are  
isolated polynucleotide molecules and vectors incorporating a chimeric PIV genome or  
antigenome which includes a partial or complete human or bovine PIV "background"  
10 genome or antigenome combined or integrated with one or more heterologous gene(s) or  
genome segment(s) of a different PIV. Chimeric human-bovine PIV of the invention  
include a partial or complete "background" PIV genome or antigenome derived from or  
patterned after a human or bovine PIV virus combined with one or more heterologous  
gene(s) or genome segment(s) of a different PIV virus to form the human-bovine chimeric  
15 PIV genome or antigenome.